

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MASUMI SAKAI

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Appeal 2006-2381  
Application 09/779,125  
Technology Center 2800

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Decided: March 13, 2007

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*Before:* HOWARD B. BLANKENSHIP, ALLEN R. MACDONALD, and  
JEAN R. HOMERE, *Administrative Patent Judges.*

MACDONALD, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 (2002) from a final rejection of claims 12, 13, 15, and 16. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

Appellant invented a furnace-type atomic absorption spectrophotometer that heats a sample held in an electrically-conductive tube by controlling a heating current passed to the tube. After atomizing the

sample, a beam of light is passed through the sample to measure its absorbance. A heating control means digitally controls the heating current such that the monitored temperature value will approach a specified target temperature value. A parameter setting means sets parameters that determine response characteristics of the heating control means and adjusts the parameters according to the kinds of elements to be detected. As a result, the heating control means' indicial response characteristics are controlled in units of milliseconds when the tube is heated.

Independent claim 12 under appeal reads as follows:

12. A furnace-type atomic absorption spectrophotometer comprising:

a tube for heating a sample therein;

monitoring means for monitoring temperature of said tube and outputting a monitored value indicative of the monitored temperature;

heating control means for digitally controlling heating current for heating said tube such that said monitored value will approach a specified target temperature value; and

parameter setting means for setting parameters that determine response characteristics of said heating control means, said parameter setting means adjusting said parameters according to kinds of elements to be detected and thereby controlling indicial response characteristics of said heating control means in units of milliseconds when said tube is heated by said heating control means;

wherein said heating control means includes a calculator for digitally obtaining a quantity of a specified operation of said heating control means by a PID control calculation on difference between said monitored value and said target temperature value and said parameter setting means serves to set at least one of parameters for said PID control calculation.

The Examiner rejected claims 12, 13, 15, and 16 under 35 U.S.C. § 103(a) (2004).

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Egan	US 4,159,876	Jul. 3, 1979
Pettit	US 4,669,040	May 26, 1987
Okumoto	US 5,104,220	Apr. 14, 1992

Appellant contends that the claimed subject matter would not have been obvious to the skilled artisan at the time of the invention. Specifically, Appellant argues that the prior art does not teach or suggest controlling indicial response characteristics of the heating control means in units of *milliseconds* when the tube is heated by the heating control means as claimed (Br. 4; emphasis added). According to Appellant, a control in units of milliseconds is not an obvious extension of a control in units of seconds as in the prior art. Appellant emphasizes that since atomization usually ends in about one second, a control in units of seconds would be of little use (Br. 4-5; Reply Br. 1-2).

The Examiner argues that the skilled artisan would have known that a compensating time constant of 1-5 seconds disclosed in Egan is equivalent to 1000-5000 milliseconds. According to the Examiner, the skilled artisan would therefore recognize that the heating control means may operate in and display units of milliseconds instead of seconds (Answer 8-9).

We affirm.

### ISSUE

Has Appellant shown that the Examiner failed to establish that controlling a heating control means' indicial response characteristics in units of milliseconds as claimed would have been obvious to the skilled artisan in view of a known control in units of seconds?

### FINDINGS OF FACT

At the outset, we note that the Examiner's factual findings regarding the specific teachings of the cited references to Egan, Pettit, and Okumoto (Answer 3-5) are not in dispute except with respect to the limitation of claim 12 calling for controlling indicial response characteristics of the heating control means in units of milliseconds. *See* Br. 3-5. Accordingly, we will adopt the Examiner's factual findings regarding the cited references as they pertain to the undisputed claim limitations.

Egan describes a spectrophotometer including an atomizer for receiving a sample to be analyzed. The atomizer is heated by applying electric power to a workhead 2 via a control means. A feedback circuit is connected between the atomizer and the control means that approximates the heating response characteristics of the atomizer. Significantly, the time taken to reach operating temperature when voltage is applied to the workhead depends upon the heating response characteristics of the particular workhead and may be within the range of 1-5 seconds (Egan, abstract; col. 3, ll. 1-48; Fig. 1).

## PRINCIPLES OF LAW

On appeal, Appellant bears the burden of showing that the Examiner has not established a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). These showings by the Examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See id.*; *In re Hedges*, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

## ANALYSIS

We agree with the Examiner that although the time to temperature resulting from Egan's heating control is stated in units of seconds (i.e., 1-5 seconds), a control in units of milliseconds would nonetheless have been obvious to the skilled artisan at the time of the invention.

Egan's range is equivalent to 1000 to 5000 milliseconds. Although there is a difference in three orders of magnitude between a second and a millisecond, nothing in independent claim 12 requires that the response

characteristics be controlled in one millisecond increments – or any other increment less than 1000 milliseconds – as Appellant seems to suggest. All that the claim requires is that the indicial response characteristics be controlled “in units of milliseconds” – a control that is fully met by a 1-5 second control. Even assuming that Egan’s system only enabled control in one second (1000 millisecond) increments, the scope and breadth of the claim language simply does not preclude such increments. For at least this reason, the Examiner has established at least a prima facie case of obviousness for independent claim 12 based on the collective teachings of Egan, Pettit, and Okumoto.

On the record before us, we conclude that the Examiner did not err in rejecting independent claim 12 under § 103. Since Appellant has not separately argued the patentability of dependent claims 13, 15, and 16, these claims fall with independent claim 12. *See In re Nielson*, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1987). *See also* 37 C.F.R. § 41.37(c)(vii).

#### CONCLUSION OF LAW

On the record before us, Appellant has not shown that the Examiner failed to establish that controlling a heating control means’ indicial response characteristics in units of milliseconds as claimed would have been obvious to the skilled artisan in view of a known control in units of seconds.

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DECISION

The Examiner's rejection of claims 12, 13, 15, and 16 is affirmed.

AFFIRMED

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